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Senate Energy and Technology Committee
Lansing, MI
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Environmental Regulatory Update – The Train Wreck

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Outline

- General Background
  - Emission Trends
  - Train Wreck Chart
- Emission Quality Issues
- Water and Waste Issues
- Summary of Impact
  - DTE Energy
  - CMS Energy
- Questions

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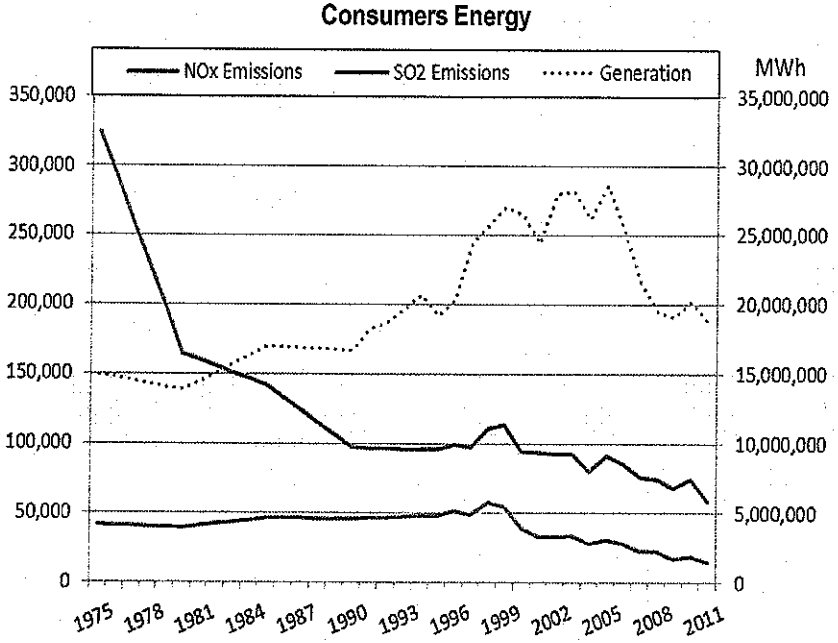
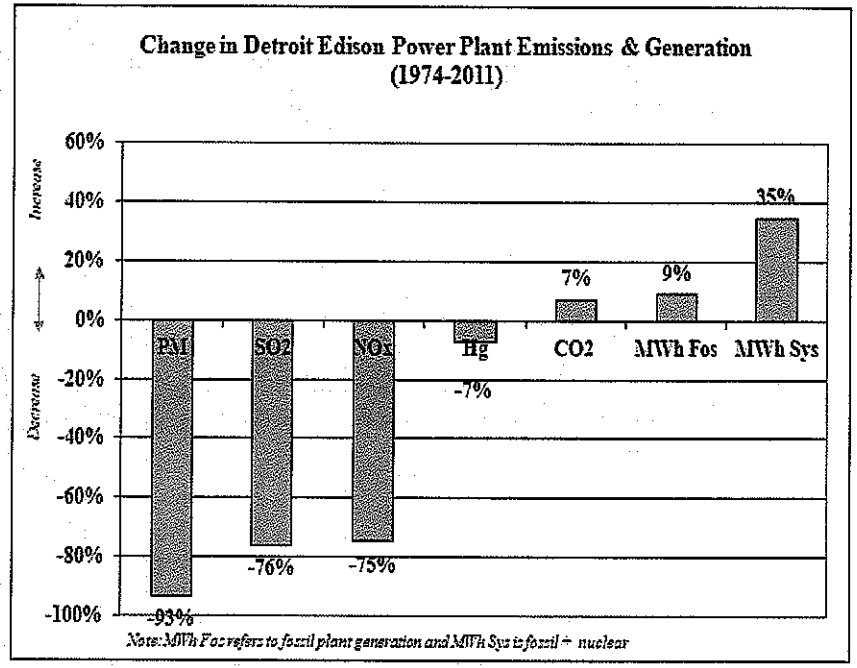
Emissions Have Been Decreasing

In the last 35 years, Consumers Energy and Detroit Edison have both dramatically reduced emissions while increasing generation to meet customer demand





CE Emission reductions (1975-2011):

- 80% decrease in SO_2
- 65% decrease in NO_x

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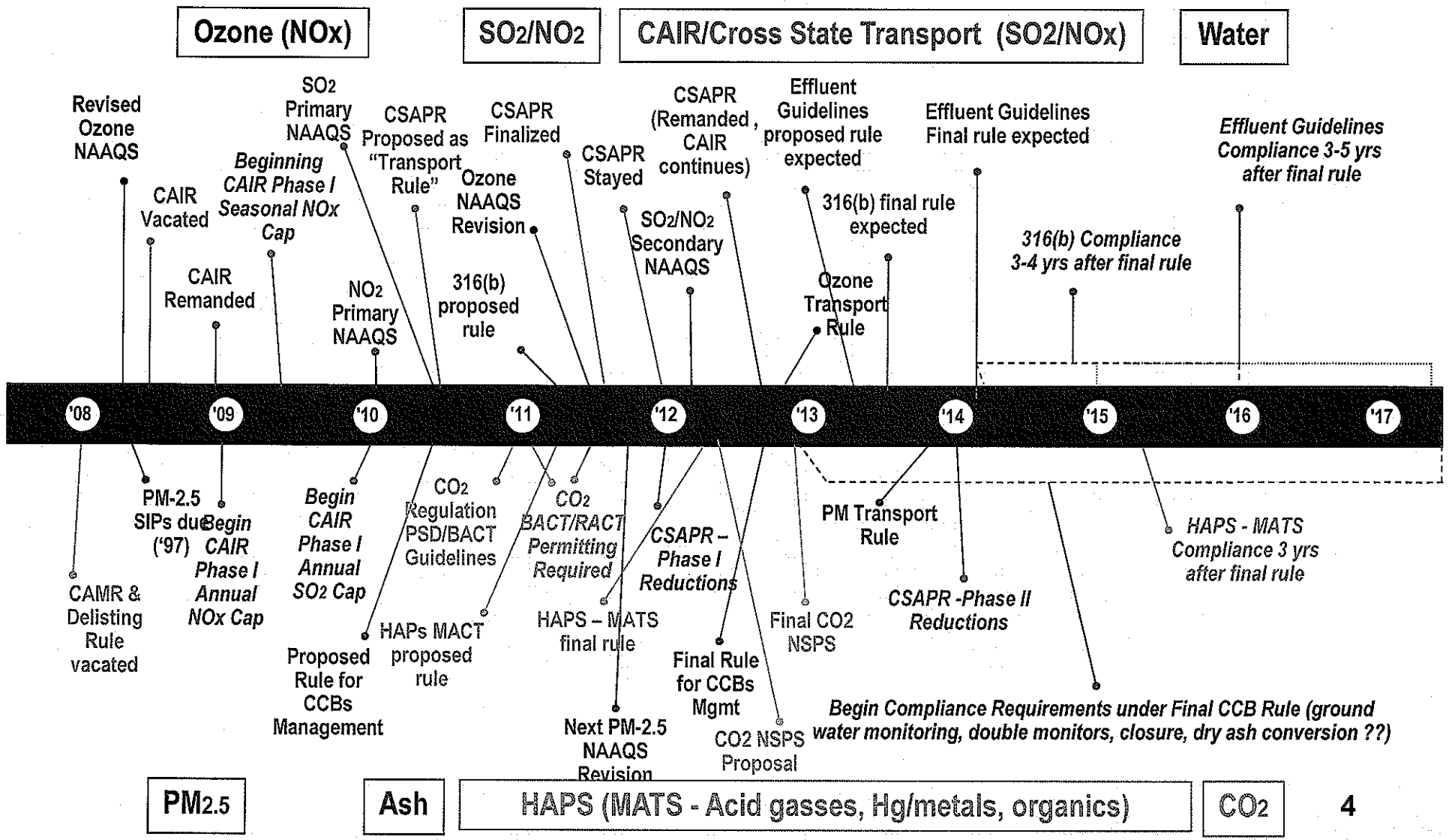
The EPA Continues To Develop Significant Regulations Directed At Electricity Generation That Must Be Considered In Total ("Train Wreck Chart")



Emission Quality Regulations Drive Significant Expenditures

- Uncertainty continues to plague the rules to address upwind state contribution of nitrogen oxides and sulfur dioxide to downwind air quality
  - US Court of Appeals for the DC Circuit stayed the Cross State Air Pollution Rule (CSAPR) on December 30, 2011, just 2 days before CSAPR was to be in effect. On August 21, 2012, the US Court of Appeals for the DC Circuit issued its decision, vacating CSAPR and leaving Clean Air Interstate Rule (CAIR) promulgated in 2006 in place. Appeal of the decision is expected
  - If decision holds, re-write of the regulations will likely take 2-3 years
- EPA finalized Mercury and Air Toxics Standards (MATS) to reduce emissions of toxic air pollutants from new and existing coal- and oil-fired power plants February 16, 2012
  - Standards for coal-fired units will reduce emissions of: Mercury, Acid gases, Non-mercury metallic toxic pollutants and Organic air toxics
  - Compliance required by April 2015, with an option to request an additional year if necessary
  - This regulation is driving significant early retirement of coal units in the Midwest, however some changes in the final rule and an alternative technology, Dry Sorbent Injection (DSI) is providing hope that the impact will be minimized for some units
- National Ambient Air Quality Standards continue to be ratcheted down which will result in compliance and permitting challenges
  - A new fine particulate (PM2.5) standard has been proposed – Depending on the final level, there could be a number of additional non-attainment areas with a potential impact on economic growth opportunities
  - States continue to work to implement a new 1-hour SO2 standard with significant discussion over the use of modeling over monitoring to define non-attainment areas (models tend to over predict)
- The potential for additional climate change or carbon dioxide (CO2) standards overhang all of the other requirements
  - Final New Source Performance Standards essentially prohibit coal
  - Standards for existing sources are expected over next couple of years

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Regulations Continue To Be Developed For Water Intake and Discharge And Coal Combustion Residuals

- **Cooling Water Intake – 316(b)**
  - Impingement and Entrainment – reducing aquatic impact through reduced flow, exclusion or collection and return.

- **Steam Electric Effluent Guidelines – regulates water quality effluent through best available treatment technology and best management practices**
  - Zero liquid discharge standard for fly ash and bottom ash transport water and flue gas mercury control wastes
  - Leachate treatment – physical and/or chemical treatment
  - Best Management Practices for coal pile runoff – pH control
  - Treatment for all metal cleaning waste

- **Ash Management**
  - Coal Combustion Residuals (CCRs) draft regulations under Resource Conservation and Recovery Act to treat this as non-hazardous or hazardous waste
  - Major impact on recycling

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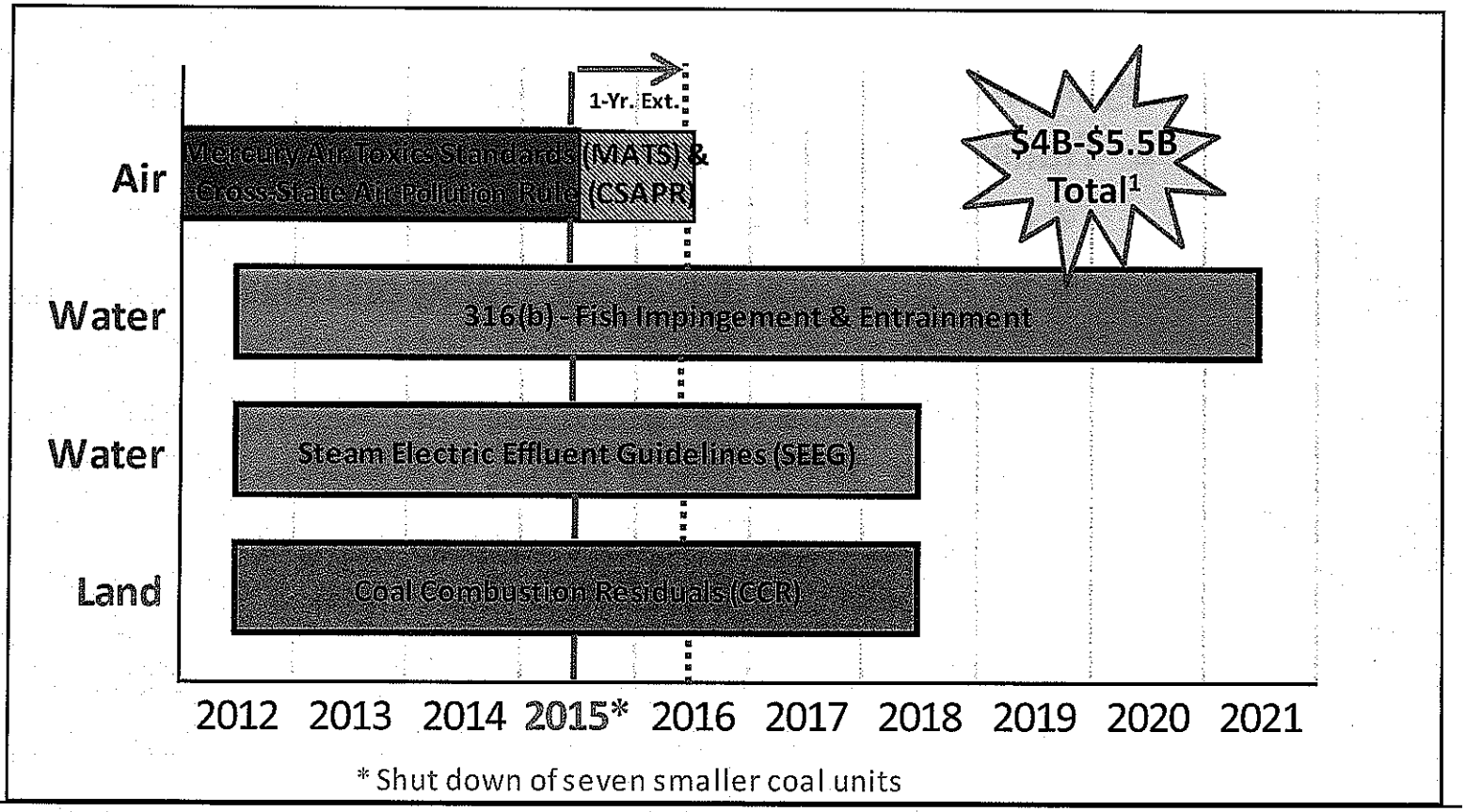
Regulatory Impact - Spending Timeline



- **Current Expected Impacts:**
- Capital constraints
- Plant Closings/Reliability Issues

- **Regulations Not Included**
- New Source Performance Standards
- Waters of the US
- Regulation of PCB
- Regional Haze
- National Ambient Air Quality Standards

[1] Spend total is a high level estimate for DTE and CE

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Challenges of Regulatory Uncertainty

- Regulatory uncertainty complicates strategic planning.
  - Transport Rules Example
    - EPA finalizes CAIR 2005 – Court Remands 2008
    - EPA proposes Clean Air Transport Rule – July 2010
    - EPA finalizes CSAPR – July 2011, with more stringent requirements than proposed rule, legal challenges filed
    - Dec. 28, 2011 – Court issues last minute stay of CSAPR
    - August 21, 2011 – Court vacates CSAPR
  - Legal challenges to other rules (i.e. MATS, GHG rules) further complicate planning as deadlines may change as a result of court decisions

However, planning and action are necessary to provide for compliance by regulatory deadlines.

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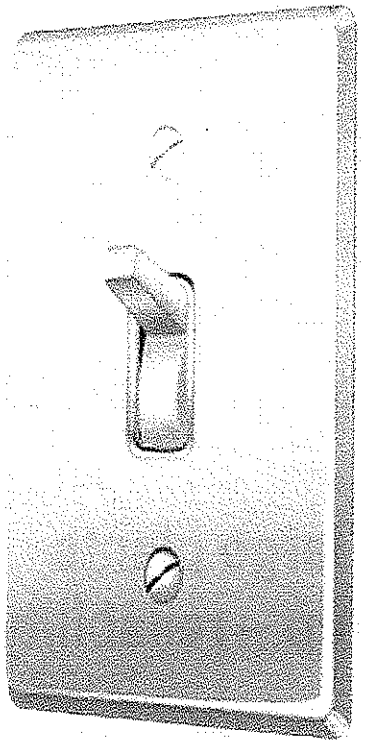
Potential Reliability Issues



- May 2012 MISO Report on impact of MATS projects:
  - 93-248 GW of coal plant retrofits nationwide (51-58 GW in Midwest)
  - 30-84 GW of new generation needed nationwide to replace retiring units (5-26 GW in MISO)
  - Retrofits and new builds will exceed historical industry maximum by 51% - 162% in Midwest
  - 45% more MW of coal outages per season to be scheduled by Fall 2015
- Will enough power be available for purchase?
- Can new generation come on-line in time – it takes time to obtain permits
- If FERC/MISO require that units run to preserve reliability – no protection for utilities for environmental non-compliance – GenOn Experience

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Overall Impacts

- Costs of retrofitting existing assets is projected to be in the range of $4.0 to $5.5 Billion (DTE and CE)
- CE Mothballing 950 MW
- Environmental Rules are changing national energy policy toward single-fuel fleet for combustion powered sources. Leaves national fleet at mercy of natural gas price volatility and pipeline capacity
- Baseload energy concentrated in fewer and fewer large plants with little to no inexpensive coal capacity for backup – reliability issues during outages, planned our unplanned

Significant progress on environmental controls and emission reductions made to-date. However, more to do to meet requirements and maintain a balanced energy supply. All must be involved to assure progress and reasonable customer impact.

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Appendix

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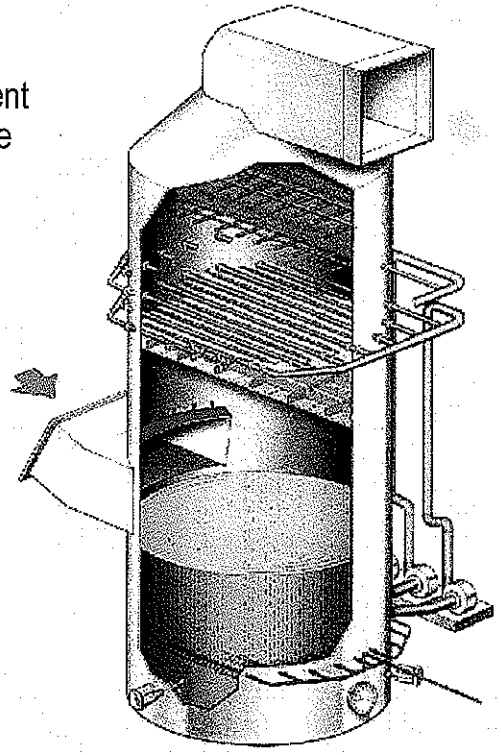
We're Reducing SO_2 Emissions by Installing Scrubbers at Power Plants

Wet Flue Gas Desulfurization (FGD)

Commonly referred to as a Wet Scrubber

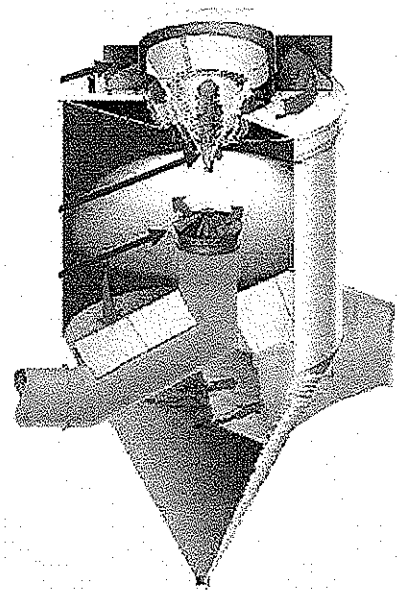
- Controls **95%+** of **SO_2** Emissions
- Installed in flue gas stream immediately before stack
- Uses limestone as a reagent and produces a marketable gypsum by-product



Dry Flue Gas Desulfurization (FGD)

Commonly referred to as a Dry Scrubber

- Controls **95%+** of **SO_2** Emissions
- Installed in flue gas stream immediately before stack, and includes a fabric filter installation
- Uses Hydrated Lime as a reagent



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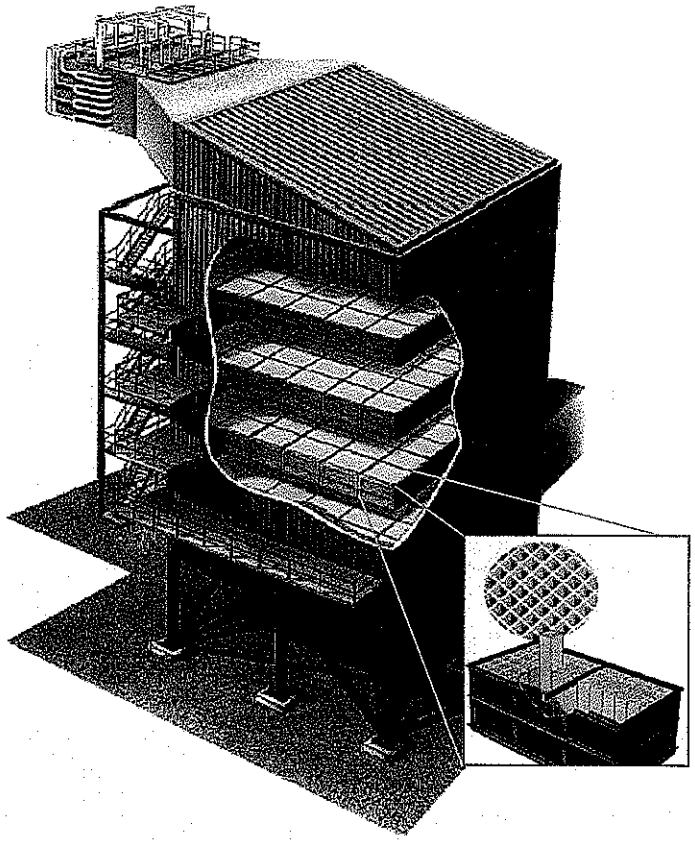
SCR Installation Will Help Us Reduce the Majority of Our NO_x Emissions

Selective Catalytic Reduction (SCR)

- Reduced NOx emissions by 90 percent
- Installed in flue gas stream between economizer and air preheater
- Uses ammonia to convert NO_x to nitrogen and water



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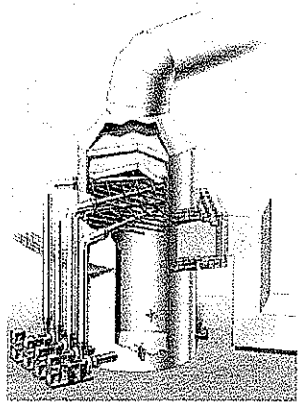
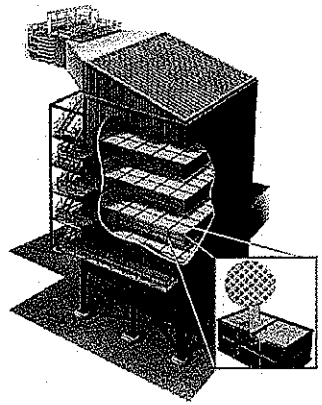
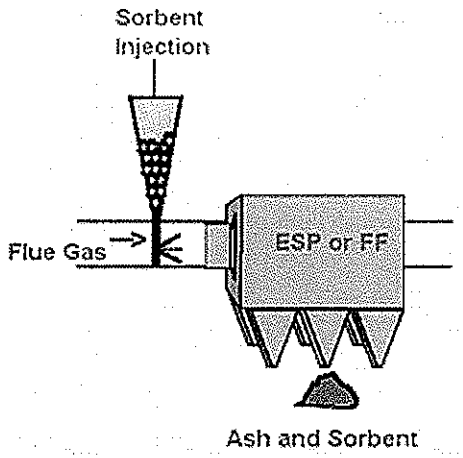
Mercury reduction is achieved by installing SCRs and scrubbers or activated carbon, sometimes with a baghouse

- An SCR and FGD installed in series will control an estimated 80 percent of Mercury emissions





Activated Carbon Injection



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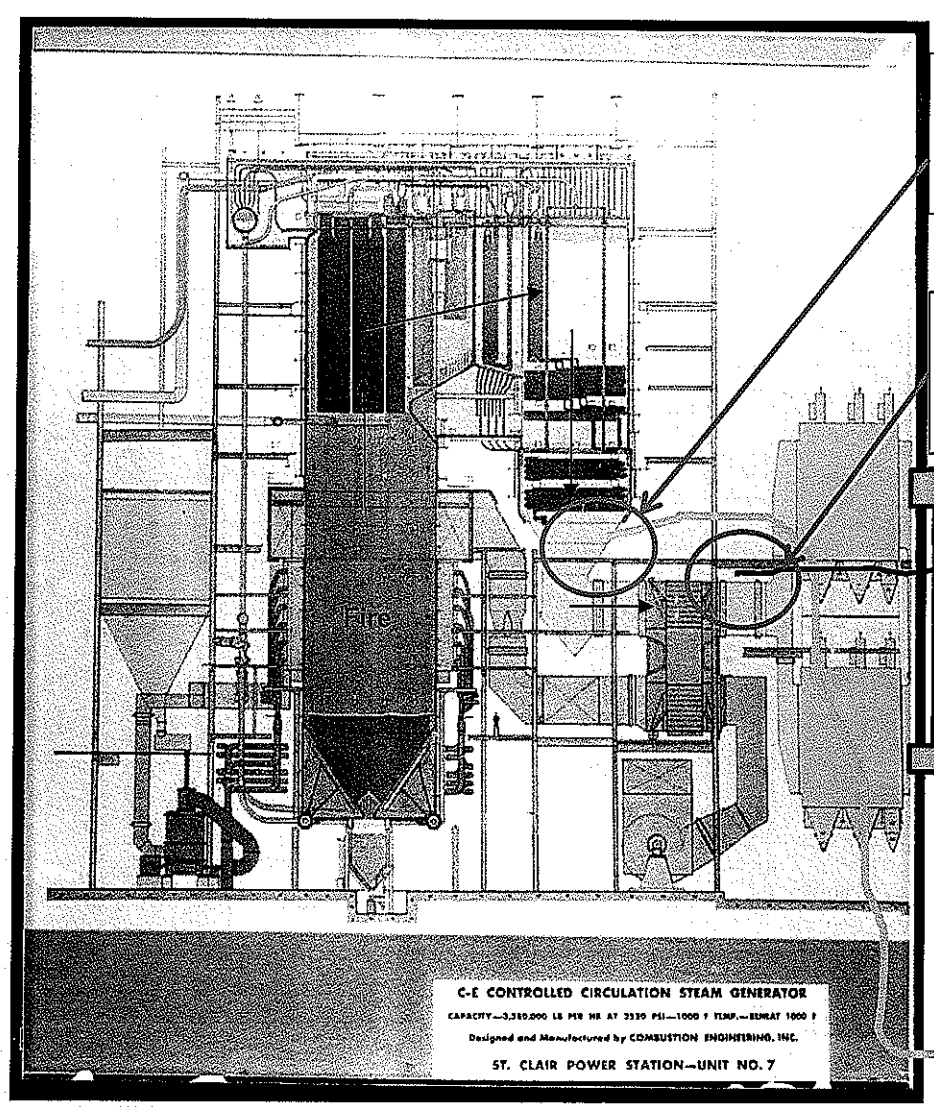
Dry Sorbent Injection(DSI)
Activated Carbon Injection (ACI)



DSI Injection point immediately downstream of Economizer outlet

AC Injection point immediately downstream of Air heater

DSI and ACI are additives that are injected into the exhaust stream to react with emissions and form non-hazardous material that are collected in the electrostatic precipitators (ESPs). These are low capital options (provided new ESPs or fabric filters are not required) but high O&M technologies, and thus are sometimes good for shorter term fixes.

ACI Skid

DSI - Used to Capture Acid Gasses

DSI Skid

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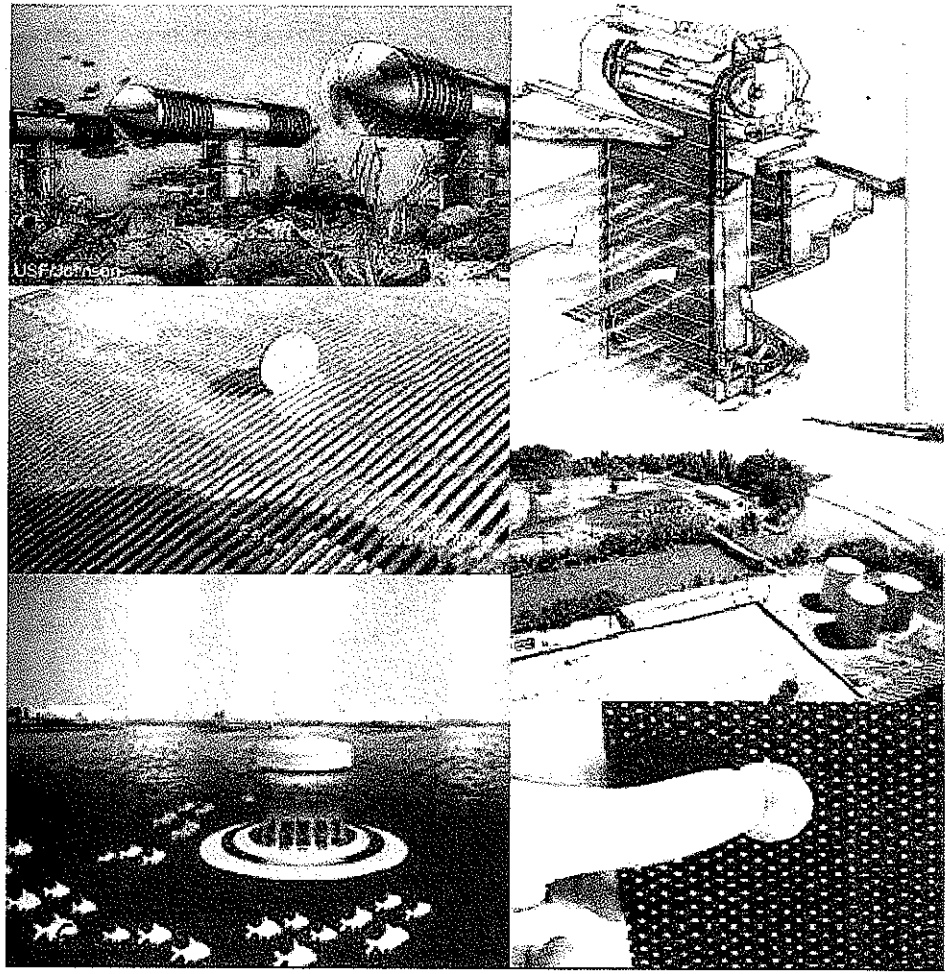
General Approaches to Reduce Aquatic Impact – 316(b)

- Reduced flow-cooling towers, variable speed pumps
- Exclusion-Wedge wire screens, nets, behavior systems
- Collection and Return-traveling screens



Concern is that EPA will require stringent limits with no option for site specific flexibility that could be just as protective at lower cost